FACTORS AFFECTING CULTIVATION OF HIGHDENSITY PLANTATION IN J&K WITH SPECIAL REFERENCE TO DISTRICT SHOPIAN & DISTRICT PULWAMA

A

Synopsis

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Declaration

I hereby affirm that the work on "Factors Affecting Cultivation of HighDensityPlantation in J&K with Special Reference to District Shopian & District Pulwama" presented in this synopsis is exclusively my own and there are no collaborators. It does not contain any work for which a degree/diploma has been awarded by any other University/ Institution. All the ideas and references have been duly acknowledged.

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INTRODUCTION

The apple is the kind of temperate fruit crops that is the most common and well-adapted. It can be planted anywhere from high altitudes in the tropics where two crops can be grown in a single year to high latitude sections of the planet where temperatures can reach -40°C (Janick 1996). Apples are the fourth most important fruit crop in the world, after grapes, bananas, and all varieties of citrus. Since ancient times, people have grown apples in South-East Asia and Europe. From there, they have spread their cultivation to nearly every region of the globe (Westwood, 1978). The USA, China, France, Italy, Turkey, Argentina, Germany, Spain, Japan, and the USSR are the main countries where this common temperate fruit is grown (Snowdon, 1990).

Nearly 76.37 million tonnes of apples are produced worldwide at this time (FAOSTAT, 2013). Jammu and Kashmir, Himachal Pradesh, Uttarakhand, and to a lesser degree, Arunachal Pradesh, Sikkim, Nagaland, Meghalaya, and Manipur cultivate apples in India, spanning an area of 289 thousand hectares with an annual yield of 2891 thousand metric tonnes (Anonymous, 2012). The Kashmir valley provides favourable agroclimatic conditions for apple farming, giving it a significant competitive edge in both production and marketing. The fruit business, which supports the state's economy in Jammu and Kashmir, has enormous potential to improve life for rural residents. The Kashmir apple has kept its status as one of the finest fruits.It indicates that the current apple plantation method, sometimes referred to as high density plantations, is ideal for enhancing apple yield and productivity. A high density orchard is any orchard that has more than 150–180 trees per acre. Even while many extremely successful commercial orchards today have 150–180 trees per acre, a larger density might be anything above 180 trees per acre. A high density orchard system, as used in this text, refers to more than just the number of trees. In addition to having more trees per acre, a high density orchard must start producing fruit within two to three years of planting. To attain this early production, a precocious dwarfing rootstock must be used.

The present system of apple plantations, also known as high density plantations, appears to be suitable for improving apple production and productivity. Any orchard with more than 150–180 trees per acre is referred to as having a high density orchard. A greater density might be anything above 180 trees per acre, however many very productive commercial orchards now have 150–180 trees per acre. For the purposes of this book, a high density orchard system includes more elements than just the quantity of trees. A high density orchard must yield fruit within two to three years of planting, in addition to having more trees per acre. Use of a precocious dwarfing rootstock is

necessary to produce this early output. Trees with semi-dwarf rootstocks can be trained to grow more slowly, but they lack the genetic potential for early bearing.

The additional setup expenses must be mitigated by consistent early fruit output. Holding trees on stronger rootstocks in the designated space needed for a high density orchard is also quite expensive. It is also required to adjust the training system and training and pruning procedures from conventional approaches in order to maximise the yield of a high density orchard. A permanent tree support system is furthermore necessary since trees will begin producing fruit early. Early in the orchard's life, trees must be harvested in order to reduce establishing costs and to control vegetative development. The quantity of trees planted per acre directly affects early productivity. The amount of light intercepted increases with the number of trees. early on in the development of the orchard, by that acre of land. 2017 (Anonymous)In the hamlet of Zainapora (Shopian), 63 kilometres from Srinagar, as part of the Indo-Bulgarian Project, the High Density Plantation System was first deployed in Kashmir in 1989–1990. The Bulgarian government's specialists abandoned the project midway through owing to the unfavourable valley circumstances (turmoil), and as a result, it was fully funded by the state government under the name Advanced Centre for Horticulture Development Zainapora. The state government has been actively involved in revitalising and developing Kashmir's High Density Plantation during the past few years. 2017 (Anonymous)

Table 1: State-wise Area, Production & Productivity of Apple during 2001-02

State	Area ('000 Ha.)	Production ('000 MT)	Productivity (MT/Ha.)
Jammu & Kashmir	90.1	909.6	10.1
Himachal Pradesh	92.8	180.6	1.9
Arunachal Pradesh	6.7	8.5	1.3
Nagaland	0.1	0.3	3.3
All India	**241.6**	**1158.3**	**4.8**

Source: Database of National Horticulture Board, Ministry of Agriculture, Govt. of India.

APPLE PRODUCTION IN INDIA

Jammu and Kashmir leads all Indian states in apple production, producing 1348 MTS in total during the 2012–2013 season, followed by Himachal Pradesh (412 MTS) and Uttaranchal (123 MTS) (Fig 1.1 and Fig 1.2).

Table 1.1 Export (quantity and value) of apple to major countries from India (2014)

Table 1.1 Export (quantity and value) of apple to major countries from India (2014)

S. No.	Country	Quantity (kg)	Value (Rs.)
1	Bangladesh	3,07,01,908	63,75,97,571
2	Nepal	49,14,306	18,63,06,570
3	Sri Lanka	4,44,316	3,44,90,521
4	United Arab Emirates	30,607	34,16,895
5	Saudi Arabia	420	14,761
6	Switzerland	50	1,435
	Total	**3,60,98,057**	**86,23,76,795**

Source: DGCIS Annual Export 2014

Fig 1.1 Apple producing states in India

Source: APEDA, 2013

Fig 1.2 Apple production in major states of India

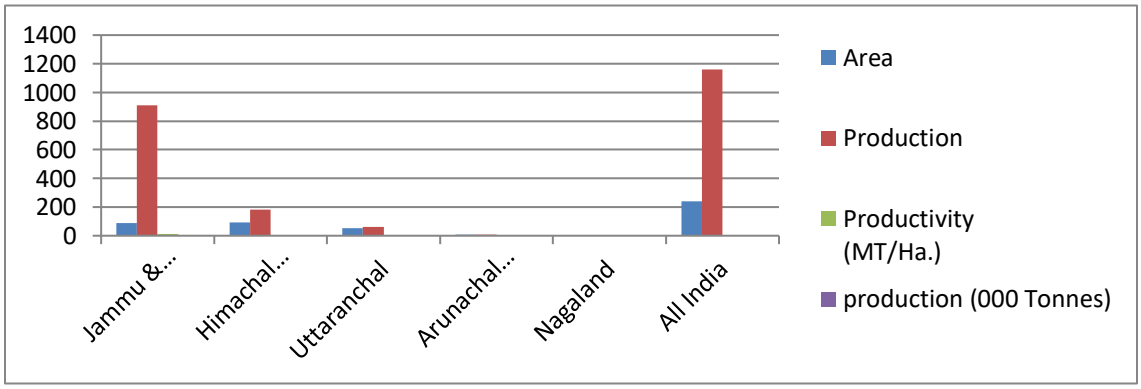

Fig 1.2 Apple production in major states of India

Source: APEDA, 2013

3, 60, 98,057kg of apples were exported by India, bringing in a total of Rs. 86, 23, 76,795 in foreign revenues (APEDA, 2013). In 2014, Sri Lanka (4, 44,316kg), Nepal (49, 14,306kg), and Bangladesh (3, 07, 01,90kg) were the top three importers (Table 1.1).

With several programmes that resulted in better revenue generation in rural regions, horticulture development is now a focus area for the state, improving the quality of life. Fruit production brought in Rs. 5000 crore in revenue during 2013–14, of which Rs. 495 crore came from dried fruits. It really generates factor earnings of close to Rs 9,000 crores, with an estimated income multiplier of 1.68. The establishment of fruit markets, the establishment of support prices, technological support, options for raising awareness, publicity inputs, research and extension, among other market intervention measures taken by the Government of India and State Governments, can all be credited for the growth momentum of the horticulture sector (Economic Survey, J&K 2014-15).

In terms of area, production, economic returns, high nutritional content, and popularity, the apple (Malus domestica Borkh) is regarded as one of the most significant and commonly farmed temperate fruits in the world. After bananas, oranges, and grapes, apples are the fourth most produced fruit in the world, and there is a rising market for them (Mittal, 2007). In 2012, there were 76 million tonnes of apples grown globally, with China accounting for 49% of this total. With more over 5% of global output, the United States is the second-largest producer. Turkey (3.8%), Poland (3.8%), and India (2.9%) are three other significant international participants. At the global level, apple output, yield, and area have shown compound growth rates of 1.2, 2.4, and 1.4 % annually from 1973–1974 to 2011–2012, accordingly. The area, output, and yield of apples increased by 3.9, 6.3, and 2.4% annually across Asia during the same time period, whereas India had growth rates of 2.4, 3.5, and 1.1%, respectively (Commodity Profile of Apple, 2014). In terms of area, India is the second greatest apple grower in the world and the second largest in Asia, with an average annual production of about 1.4 million apples (Satish, 2006). (Deepa, 2008). India produces an average of about 6 to 8 tonnes of apples per acre, far less than other nations like the Netherlands (40.40 t/ha), Belgium (46.22 t/ha), and Denmark (41.87 t/ha) (Atteri, 2003). In terms of area coverage, production, and

productivity, apple fruit farming has made significant progress in past plan periods. However, there is still a significant room for both vertical and horizontal development. Currently, Bangladesh and Sri Lanka are the major destinations for the tiny amount of apples produced in India in terms of growth.

(2003) Masoodi With its naturally advantageous terrain, temperature, and huge range of agroclimatic niches, Jammu and Kashmir State offers enormous potential for horticulture growth. It's been a long-standing tradition in Jammu and Kashmir to grow apples, and the state once had 200 different types of apples under cultivation. With a productivity of 13.07 metric tonnes per hectare, which is the highest in India and comparable to China, Jammu and Kashmir contributes about 65% of the nation's total apple production. The horticulture sector in the state contributed Rs. 5000 crores to the state's gross domestic product in 2013–14, of which apple alone accounted for about 4000 crores (Ahmad, 2013). The Kashmir apple has maintained its status as one of the best Indian fruit. Ambri is "Par excellence" among the several native apple types found in the state. Apple has been more popular with producers than any other fruit crops because of its greater returns and capacity to withstand transportation stress (Mir, 2014).

By exporting 7 crore boxes of apples each year, the apple proven to be the most significant fruit crop in the state's horticultural industry. Nearly all 10 districts in the Kashmir area grow apples, with Baramullah, Kupwara, Shopian, and Anantnag being the top producers. A few isolated locations in the Jammu and Ladakh areas also generate the lower amounts. For cultivars with early developing fruit, fruit harvesting starts in August and lasts until November, with September and October seeing the most activity. The apple crop dominates the horticulture sector and plays a significant part in the state's economic situation. Apple, which affects around 500,000 households, is important to the state's agricultural economy. Almost 30% of the overall apple production.Pre-harvest drop causes a crop to go to waste, totaling around 0.25 million metric tonnes (MT) of such fruit annually (Shah, 1999).

Although apple production in the state is rising with favourable economic momentum, exports have not increased much. The motivation for producers to increase apple quality and productivity has totally been destroyed by weak production and supply chains, bad marketing techniques, and a lack of marketing system openness. Lack of appropriate pollinators, ineffective pest and disease control, the use of seedling rootstock with unknown performance, monoculture of a few old cultivars, poor pruning and training techniques, a lack of institutional credit, and ineffective factor inputs are some other bottlenecks that have shifted the terms of trade against producers.

While increasing output is crucial, marketing also plays a crucial part in giving a crop a commercial direction. Although there have been several initiatives to enhance apple production in the state, market regulation has not gotten enough attention (Shaheen and Gupta, 2002). The Kashmir Valley must handle apple marketing with extreme caution and particular consideration since it is a complicated phenomenon. The state's current marketing strategy is prone to shifting more advantages to middlemen at the expense of apple farmers. The current marketing structure is such that these strong intermediates do 87% of all marketing-related tasks (Bhat, 2010).

Only a small portion of the apples grown in India are utilised for processing into goods like apple juice, jelly, or jam; the majority are consumed fresh. According to the Horticulture Census 1999-2000, roughly 30% of prefalls and culled apples in A, B, and C grades contribute for a significant quantity of about 50 thousand tonnes, which must also be utilised as raw material for the processing sector (Deodhar et al., 2006).

The current study, "Factors Affecting Cultivation of High Density Plantation in J&K with Special Reference to District Shopian & District Pulwama," will analyse the overall performance of the apple sector in Jammu and Kashmir in this context. The study will highlight certain important HDP characteristics for increasing apple production in Jammu and Kashmir. The study will be based on the null hypothesis that it will give policy planners a roadmap for setting an agenda to increase apple production with an effective delivery system, which is the primary source of livelihood and a contributor to the region's economy, versus the alternative hypothesis that it won't. Considering the favourable climatic conditions in Kashmir as Due to the growing global demand for

Apple, the current study is being conducted in the Kashmir Valley with the following objectives:

- To study various methods of creating awareness levels of among farmers towards High Density Plantation.
- To study the knowledge of apple growers about the production technology Of HDP in apple.
- To study impact of High Density plantation on Income, Production and Economy of District Shopian and District Pulwama

REVIEW OF LITERATURE

Review of literature was undertaken keeping in view the variables considered for the study. It was rather difficult to find adequate research studies exclusively related to recommended practices of high density apple plantation. Therefore, studies related to other fruit crops were also reviewed and presented covering all aspects of the investigation comprehensively under the following headings:

1.3 **Knowledge of respondents**

Patil and Jadhav (1987) found that a majority of the respondents (53.00%)lacked accurate understanding about chemical fertilizers.

Jagadal (1989) only 30.84 percent of respondents in the Belgaum district of Karnataka state fell into the category of medium level of knowledge, while more than one third of the respondents could be classified as having both low (35.83%) and high (33.33%) level of knowledge regarding cabbage cultivation practises.

1.4 Adoption Level

Hanchinal et al. (1991), 17% of respondents in the Dharwad taluk had fully implemented plant preservation techniques, compared to 82%.00% who had done so partially and 1% who had not. Additionally, they stated that only a portion of pest control methods were being used due to ignorance of the appropriate chemical dosage for pest management and the expensive expense

of plant protection chemicals.

Basavaprabhu (1995) conducted a study on knowledge level and adoption behaviour of vegetable growers with regard to integrated pest management in Bangalore urban and Kolar district of Karnataka, the results showed that, majority of the vegetable growers belonged to medium adoption level category with (47.77%).

1.5 Socio-economic profile of respondents

Age

Sheela (1991) performed a research on dairy-practicing women in the Bidar area, finding that 55.86% of the women were middle-aged, 30.17% were young, and just 13.97% were elderly.

Raghuprasad (1992) carried out a survey in Chitradurga district and found that 85.33 per cent of the sericulturists were middle aged. Only 9.33 per cent and 5.33 per cent of the sericulturists belonged to young and old age groups.

1.6 Education

Mande and Kulkarni (1990) in their study on acceptance of suggested practices of mango by the farmers observed that majority of the respondents (80.00%) have completed 'high school' level education while 15.00 percent of the respondents were illiterate and 5.00 per cent respondents weregraduate.

Angadi (1999) conducted a study on the knowledge and marketing practises of pomegranate growers in the Bangalore district and found that 30.00% of them had completed middle school, followed by 20.62% who had completed high school, while 22.50% of the respondents were illiterate, only 3.75% of whom had completed primary education, and nearly 12.00% of farmers had graduated. Farming experience

ChandreGowda (1997) found that most of the farmers had low farming

experience (48.33%), followed by medium (34.67%) and high (17.00%) farming experience, respectively, in his study on chrysanthemum in eastern dry zone of Karnataka. farmers.

Hanchinal (1999) the majority of the farmers in the Haveri district of Karnataka had medium farming experience, followed by high (44.16) and low (9.17%), according to their survey.

1.7 Land holding

Lokhande (1990) In his study on the adoption of a certain suggested package of grape production techniques by farmers in the Osmanabad area, the author found that the majority of respondents (76.60%) had land up to 10 ha, 20.90% had property between 10 and 20 ha, and just 2.50% had land larger than 20 ha.

Raghuprasad (1992) According to his study on sericulturists, huge landowners made up 86.0% of the respondents, followed by small landowners (10.67%) and a small percentage (3.33%) of marginal landowners.Sources and Channels of communication

Sakharkar (1995) showed that 61.0 and 43.000% of the respondents, respectively, owned radio and television. Among them, 13.66 and 12.02 percent listened to the general and agricultural radio programmes on a regular basis. 39.23 and 30.00% of them regularly watched general and agricultural television programming, respectively. He also stated that 63.08 and 58.33 percent of respondents, respectively, read newspapers and agricultural publications on a regular basis.

Saravanakumar (1996) In the Dharmapuri area, it was found that 23.33 percent of mango producers subscribed to and frequently read newspapers and farm publications, while 42.50 and 42.86 percent of respondents regularly listened to and saw agricultural programmes, respectively.

Innovativeness

Ananda (1992) did a study on the effectiveness of drip irrigation among grape producers in Bangalore, Karnataka, and found that 40% of adopters showed a medium propensity for innovation, compared to 30% who fell into either the low or high inventive proneness groups.

Balasubramani (1997) did a research on rubber farmers in the Karnataka state's Dakshina Kannada district and found that 37.00% of them fell into the medium innovativeness group, followed by 35.00 and 28.00% in the high and low innovativeness categories, respectively.

Economic motivation

Sheela (1991) According to her study on diary-keeping women, the majority of respondents (67.00%) indicated a moderate level of economic incentive. Only 18.0 and 15.0 percent of respondents, respectively, reported having low and high levels of economic motivation.

Reddy (1995) performed a study on the implementation and awareness of advised mango farming methods in Karnataka's Kolar area. According to the report, strong economic motivation was reported by 40.0% of mango producers, followed by medium economic motivation at 34.0% and low economic motivation at 26.0%.

Extension contact

Chauhan (1999) found that 26.00% of the respondents, or more than one-fourth, had no interaction with any extension staff. Additionally, he stated that just 8% of respondents had high extension contact with the field extension staff, while 49% of respondents had low extension contact and 17% had medium.

Singh (2000) reported that 89.09% of the respondents had low extension contact, compared to 8.18% and 2.73 % of respondents who had medium and

high extension contact, respectively.

Mass media exposure

Chauhan (1999) showed that 45.00% of maize producers had limited exposure to different communication channels, 16.00% had medium exposure, and just 7.00% of respondents had strong exposure to such easily accessible mass media. Additionally, he mentioned that almost a third of respondents (32.0%) had no exposure to the media.

Dhiman (2001) discovered that the vast majority of respondents (90.83%) had little or no exposure to the media, while just a tiny minority (5.00%) and 4.17%) had moderate or high exposure. Risk orientation

Ravishankar (1995) found that medium risk carrying ability was present in 65% of respondents, followed by high risk orientation in 20% and low risk orientation in 15% of respondents, in his study..

Saravanakumar(1996) on his research at Dharmapuri's Krishnagiri taluk.According to research conducted in a Tamil Nadu district, the majority of mango producers (70.83%) fell into the low (15.0%) and high (19.17%) risk orientation categories, respectively.

2.1 Scientific orientation

Nath (2005) In his survey, he found that 50% of respondents had a high scientific orientation, compared to 34% and 16% who had medium and 12% who had low scientific orientation.

Kaundal (2007) in his survey, he found that exactly 50% of respondents had a strong scientific inclination, whereas 34% and 16% of respondents had a medium or low scientific orientation.2.2 Prospects of high density apple

plantation

Cahn and Goedegebure (1992) According to research that looked at the financial effects of apple production in relation to tree density, apples were ultimately more lucrative at densities of up to 5000 trees per hectare. Additionally, the payback period (4th year) analysis decreased as tree density increased. In high density planting of 400 trees per ha, Ram et al. (2001) found that the yearly fruit output of guava grew from 0.30 t ha-1 in the fourth year to 18.0 t ha-1 in the fourteenth year, and the total yield was 74.12 tonnes in 12 years of fruiting. However, with the decline in tree population to 177, 100, and 64 trees ha-1, respectively, cumulative yield reduced to 43.29 t ha-1, 25.52 t ha-1, and 16.91 t ha- 1. tree development, fruit yield In terms of tree and fruit quality, there were no appreciable differences among the planting densities of 5 x 5 m, 7.5 x 7.5 m, 10 x 10 m, and 12.5 x 12.5 m

Proposed Methodology during the tenure of research work

Research methodology is a strategy for methodically addressing the research topic. In this section, we'll look at the numerous approaches typically used by researchers to investigate their issues, as well as the reasoning behind those approaches.

Selection of the study area

The two districts, Pulwama and Shopian, were deliberately chosen since they stand for Jammu and Kashmir's top two apple-producing regions. Of these two areas, the Shopian district is referred to as the Apple Bowl of the state because it is renowned in the horticulture industry for producing apples of the highest calibre. The Kashmir Valley's District Pulwama & Shopian was specifically chosen since it has the largest areas (15,800 ha & 26,231) under apple cultivation and produced 1.73 & 2.76 M.T. in 2014–15. Additionally, the farming community in the district has a strong preference for apple production as a means of agricultural diversification.

Sampling design

Commensurate with the objectives of the study, the sampling design adopted in the study was stratified simple random sampling technique and the sampling process consisted of following steps:

- Locale of the study
- Selection of the respondents
- Variables and their measurement
- Construction of interview schedule
- Method of data Collection

Locale of the study

Two districts of the Kashmir Valley *i.e.* Shopian & Pulwama were selected for the present study as majority of the High Density apple growers are located in these

Selection of the respondents

The offices of the Chief Horticulture Officers and District Horticulture Officers of the relevant districts provided a list of high density apple farmers. For the purpose of this study, apple producers who have High Density Apple Orchards on an Area of One Kanal and above were kept. 200 High Density Apple Growers were selected at random in proportion from this list for the current study.

Variables and their empirical measurement

The variables for the study were chosen based on the analysis of the literature and the advice of the specialists. The study includes the factors that were determined to be pertinent to the current investigation. In the pages that follow, both the method employed and the tools used to measure the variables are detailed. Based on mean and standard deviation, the respondents were divided into several groups taking into account the dependent and independent factors.

Data Collection

Nature and source of data

A pre-tested questionnaire was used to get the primary information on apple production, post-production activities, market functionaries, and other restrictions from the sample farmers. Similar to this, using a pre-tested questionnaire, primary data were also gathered from dealers and intermediates describing the quantity handled, various marketing channels, and limits experienced by them.The relevant secondary data were collected from books, web sources, Directorate of Horticulture Planning and Marketing, Jammu and Kashmir and Sher-E-Kashmir University of Agricultural Sciences and

Technology of Kashmir, Jammu and Kashmir,etc.

ITEMS STUDIED UNDER INVESTIGATION FROM FARMERS

Varieties grown

Cropping pattern

Factors affecting HDP in Kashmir Valley.

TOOLS OF ANALYSIS

The information gathered from original sources underwent many levels of analysis. The gathered information was tallied using Microsoft Excel and properly displayed to allow for sensible inference. Simple percentages were used to compute the price spread, producer share in consumer rupees, middlemen's profit, and channel efficiency. To get intelligible findings, the data were summarised using basic means and Likert scaling approaches, complemented by the use of statistical tools like averages and percentages.

LIMITATIONS OF THE STUDY

The present study is not a holistic study but with the following limitations

• The study is based on data that was gathered from respondents' recall memories, including farmers, growers, and traders, which may not accurately reflect the facts.

• Because the respondents are unsure of the true goal of the study, they are reluctant to provide accurate information.

• Respondents also have a time constraint; the study's investigator has limited financial and human resource. Additionally, because the study only relates to a certain population, generalization of results is not possible.

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PROPOSED CHAPTER SCHEME

Chapter	Description
I	Conceptual framework of Apples its production & two Major apple producing states of J&K
II	Review of literature
III	Research methodology
IV	Analysis and interpretation of data
V	Findings, summary of conclusion & suggestions
Vi	Bibliography

REFERENCES

Journals and Magazines:

Books:

- Instant Horticulture
- Handbook of horticulture

Reports:

- Annual Reports, Department of Horticulture Planning & Marketing.
- Statistical Tables Relating to Department of Horticulture.

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